

STRESS FRACTURES

What is a stress fracture?

Every day, the body produces new bone to replace bone lost to the stress of daily living. This process is usually in a balance, regulated by the body. However, this balance can be upset by excessive physical training. When muscles become fatigued and are unable to absorb the shock of physical activity, the stress is transferred to the bone, resulting in a "micro-crack" in the bone, called a stress fracture. Think of a stress fracture occurring from suboptimal stress which is cumulative; this is different than forces required to fracture a bone.

What causes a stress fracture?

The most common cause of a stress fracture is a sharp increase in physical activity and/or intensity without adequate periods of rest. It can also be caused by the impact of a surface (playing basketball on a concrete court rather than a wood court), poor equipment (worn out shoes, for example, that can't provide adequate foot support or absorption of vibration), or increased physical stress (a basketball player who dramatically increases his or her playing time, for example).

Are women at a higher risk for a stress fracture than men?

Yes. Medical studies support the theory that female athletes experience more stress factors than males. Many sports medicine professionals attribute this to a condition referred to as "the female athlete triad". The triad consists of eating disorders (bulimia or anorexia), amenorrhea (disrupted menstrual cycle) and osteoporosis. These disorders can result in decreased bone mineral density and an increased risk of stress fractures. Women who run more than 40 miles/wk are at increased risk for developing an abnormal menstrual cycle (irregular, intermittent, or cessation). This is why your doctor may ask about your menstrual cycle.

Where do stress fractures occur?

Although stress fractures occur in nearly every bone in the human body, more than 50% of all stress fractures occur in the lower leg and foot, because these are weight bearing bones. Stress fractures may be associated with a specific sport such as the humerus (upper arm bone) in throwing sports, the ribs in golfing and rowing, the spine in gymnastics and the lower extremity and foot in running activities

What are the symptoms of a stress fracture?

Stress fractures produce pain in a well localized area directly over the area of bone where the fracture has occurred. The pain can increase with activities and decrease with rest. There may be local swelling that is visible, but this is not always the case.

How is a stress fracture diagnosed?

First, X-rays of the affected area should be obtained, although they may appear normal because the "micro-cracks" are not visible. If x-rays are obtained several weeks after the onset of pain, you may see callus forming around the bone at the fracture site. This would confirm the suspected diagnosis. The diagnosis in the early stages of a stress fracture can usually be confirmed by an MRI or a bone scan. An MRI is very sensitive to detecting abnormalities in bones, without being invasive. In a bone scan, a radioactive "tracer dye" is injected into the bloodstream. All of the bones will absorb some of the tracer, but if there is a stress fracture, it will absorb far more at the fracture site and will appear much darker on the scan than the uninjured bones.

How are stress fractures treated?

The standard treatment is rest and activity modification. You need to avoid the activity that caused the stress fracture in the first place. Physical therapy is helpful to maintain muscle size, strength and flexibility while allowing a stress fracture to heal. It takes six to eight weeks of treatment for most stress fractures to heal. A small percentage of these may have a delayed healing response that takes longer than the standard six to eight weeks, but do ultimately heal. For stress fractures that just don't heal, there usually are surgical options that are very successful. Your orthopedic surgeon would determine if and what type of surgery you may need. Generally, six to twelve weeks of physical therapy are required post-operatively to maximize your outcome. The vast majority of stress fractures of the foot are treated non operatively.

An exception is the so called "Jones fracture" which occurs in the 5th metatarsal of the foot---it may be prudent to surgically treat this fracture early in the athlete because of its propensity for delayed healing. Additionally, stress fractures of the navicular are treated surgically. Another stress fracture that may require surgical treatment is a stress fracture of the hip called the "femoral neck"; this fracture can progress to an actual fracture with displacement and may require operative treatment. Rarely, fractures of the mid tibia region may progress to non-healing and demonstrate a "dreaded black line" on x-ray indicative of a non-union. This fracture may require operative treatment whereby the surgeon surgically places a rod down the internal tube of the bone to act as an internal splint to help with healing. In some problematic stress fractures your surgeon may recommend a "bone stimulator" which is worn for a variable time period during the day and emits an electrical current which can help bones heal.

Finally, if you have a stress fracture and particularly if you are female your surgeon may refer you for a bone density study called a DEXA scan. This study gives us age adjusted values for patients relative to the bone density of two locations susceptible to osteoporosis and fractures, the hip and the low back. This may particularly be advised in the patient who has had premature menopause (eg. hysterectomy and removal of ovaries, multiple stress fractures, peri-menopausal, eating disorders, chronic prednisone usage). If a DEXA scan is suggested your surgeon may direct you to an internist.